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THE RADIOLOGIST'S RESPONSIBILITY IN BRONCHOGENIC CANCER*

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Bronchogenic or bronchial carcinoma is a common neoplasm, ranking second only to carcinoma of the stomach as a cause of cancer death in males. Boyd[1] quotes a number of series of autopsies, with the incidence of bronchogenic carcinoma varying from 1.2 to 2.6 per cent. Rubin[2], quoting autopsy figures from the Montefiore Hospital over a thirty-year period, gives 333 deaths from bronchial carcinoma in 6,750 autopsies, or approximately 5 per cent. This last figure is, unquestionably, high, due to the nature of the hospital. Rubin[2] further states: "In a general hospital bronchogenic carcinoma constitutes from 1 to 2 per cent of autopsy material and about 10 per cent of all forms of malignant neoplasm". The disease is much more common in men than in women, the sex incidence being 80 to 90 per cent in men. The commonest age incidence is in the fourth and fifth decades, although a number of cases have been reported in younger and older individuals. The reported incidence of the disease has increased very markedly over the past twenty years. Opinion differs as to whether this increase is apparent or real, or both. With the advent of successful pneumonectomy, interest in this tumour has greatly increased. The pathology of the tumour has become better understood and a closer search for this lesion is being made in all autopsies. The above factors would reveal higher mortality figures, which are apparent rather than real. With an increasing percentage of the population over forty years of age, it is to be expected that carcinoma of the bronchus, along with all other forms of malignant disease, will show an actual increase as well as a relative one. The increasing average age of the population is indicated by the fact that, fifty years ago, only 17 per cent of the population of the United States was above forty-five years of age. In 1940 this percentage had risen to 26.5 and it is estimated that fifty years hence 40 per cent of the people in the United States will be over forty-five years of age.

Pathologically, three types of bronchial cancer are described by Boyd[1]. These are adenocarcinoma, squamous carcinoma and indifferentiated carcinoma. The latter group in the past has been variously described as alveolar cell carcinoma, oat cell carcinoma and as sarcoma of the lung. The disease is more prevalent in the larger bronchi, arises from bronchial epithelium and tends to spread both along the bronchus and through its walls into the surrounding lung. Bronchial occlusion is relatively common, with atelectasis and with complications dependent upon atelectasis with or without superadded infection. The size of the area of atelectasis will, of course, be dependent upon the size of the bronchus occluded. Another feature of the pathological changes in these lesions, which is of special interest to the radiologist, is the tendency to recurring, slowly resolving pneumonitis, bronchiectasis, or lung abscess, either purulent or due to breaking down of tumour tissue.

The symptomatology of bronchial carcinoma is not clear-cut and it is not my purpose to discuss it in detail. Certain features are, however, worthy of special note. The onset of cough, irritative or productive, particularly if the sputum is blood-tinged, with chest pain coming on in a patient over 40 years of age is strong presumptive evidence of new growth. Recurring bouts of pneumonia, particularly if occurring in the same portion of the lung, must be regarded with suspicion. An apparent pneumonia which takes longer than the average time to resolve must also be regarded with extreme suspicion. There maybe disease in the underlying lung or bronchus. In a number of these two latter groups of cases, that is, the recurrent or slowly resolving inflammatory lesions, the underlying disease may prove to be bronchiectasis but, certainly, the cases demand further investigation than simple serial postero-anterior radiographs of the chest.

The nature of the disease is such that many cases develop symptoms late. Cough and sputum may be overlooked by the patient and, sometimes, by the doctor, on the basis of a chronic upper respiratory infection. Chest pain may not

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be an outstanding feature and may be gradual in onset and tolerated by the patient a long time before forcing him to consult his physician. In most centres over 50 per cent of cases of bronchogenic carcinoma are obviously inoperable for cure when the diagnosis is first made.

The stage of the disease when diagnosis is first made has, of course, obviously affected the operative cure of this disease. The figures for five-year survivals, quoted from various chest surgery centres, are surprisingly similar and uniformly low. Lindskog and Bloomer[3] state: "In an unscreened (not pre-selected) series of bronchogenic carcinoma in a general hospital more than half are unsuitable for operation when first hospitalized, not more than half of the explored cases will be resected, one in five of the resections will be a hospital mortality and less than 5 per cent of the original group will survive five years". It is obvious that a decrease in the time from the onset of the disease to the time when the patient is operated upon would raise the percentage of surgical cures.

The radiologist must accept a large responsibility in the detection of earlier bronchogenic carcinoma on plain radiographs, or must raise the question of bronchogenic carcinoma so that further investigation will be done and he must always be on his guard in the consideration of small peripheral lesions which do not clear rapidly, or in slow-resolving pneumonic lesions, or in recurring inflammatory disease in the same location in the chest. He must be prepared to carry out more elaborate X-ray investigation in all suggestive cases. These further investigations will be described later.

The widespread extension of survey chest films will, unquestionably, reveal a number of cases of bronchogenic carcinoma which are either asymptomatic or are not producing symptoms sufficiently grave to warrant the patient seeing his own physician. It, therefore, becomes the duty of the radiologist and all others seeing chest survey films to be particularly cancer-minded in their interpretation and to consider the survey as being for cancer as well as for tuberculosis. With regard to tuberculosis, the confusion of bronchogenic carcinoma with tuberculosis or the co-existence of the two must not be overlooked. Many cases of bronchogenic carcinoma have been admitted to sanitoria under the mistaken diagnosis of tuberculosis. It is also true that a number of cases of bronchogenic carcinoma are co-existent with pulmonary tuberculosis, (Fried)[9] The fact, therefore, that the patient has pulmonary tuberculosis must not prevent one thinking of the possibility of bronchogenic carcinoma as well.

Many patients with a suggestive history and plain radiographic findings suggestive of bronchogenic carcinoma are subjected to bronchoscopy. It is well for the radiologist, therefore, to realize the limitations of this method of examination. Most upper lobe bronchogenic carcinomas and many relative peripheral lesions in the middle and lower lobes will not be seen by the bronchoscopist. He may visualize distortion of bronchi or fixation of the carina or the presence of secretion in a number of cases in which the growth itself is not visualized. In a number of cases the bronchoscopist will, however, obtain a positive biopsy upon which the diagnosis of the case may rest. In a series of cases at the Toronto General Hospital, reported by Gagnon[5], of 153 cases submitted to pre-operative bronchoscopic examination, 124 cases showed evidence of disease of the bronchial tree and 105 produced positive biopsies of carcinoma. This figure is comparable with those of a number of other centrea. Rubin[2] states: "Bronchoscopy gives positive results in 75 per cent of incidence, approximating the incidence with which the disease affects the major bronchi". It will be seen from the above that there remains 25 per cent or more of bronchogenic carcinomas in which the bronchoscopist does not obtain positive findings.

Since Papanicolaou[6] wrote his article on "The Diagnostic Value of Exfoliated Cells from Cancerous Tissue", considerable interest has centered on the cytological studies of sputum and bronchial secretions in the diagnosis of cancer of the lung. It would seem that, at its present state of perfection, it is not the entire answer to the question and is subject to a considerable factor of error. Thus McKay, et al[7], examining bronchial secretions obtained by bronchoscope, found tumour cells in the slides of forty, or 74 per cent. Fourteen false negative and three false positive diagnoses were also made. Liebow, Lindskog, and Bloomer[4], examining both secretions obtained from bronchoscopic examinations and sputum, found an average of 42.8 per cent of positive cases in carcinoma of lung and 5.1 per cent of false positives in examination of sputum. Examination of bronchoscopic smears yielded 30 per cent of correct positive diagnoses and 4.7 per cent of false positive diagnoses. They make another interesting statement in their summary, as follows: "The cytological technique increased the percentage of pre-operative microscopic diagnoses to 76 per cent from the 38 per cent available from bronchoscopic biopsies alone". They also state: "Most tumours yielding positive smears were centrally located, and all of the resected tumours were of large size". This, again, would seem to indicate the importance of the radiological findings in peripheral bronchogenic cancer.

Radiological Findings

The classical signs of bronchogenic carcinoma are a mass in the lung with or without associated gross atelectasis, as evidenced by lobar or lobular density, mediastinal shift, elevation of the diaphragm, and narrowing of interspaces. In many cases the mass itself is not visualized, only the atelectasis being visible on plain films. These signs frequently indicate late bronchogenic carcinoma and, of course, may be associated with demonstration of involved paratracheal glands, pleural effusion, involvement of ribs, or with associated palpable glands in the neck or evidence of pulmonary or distant metastases, all of which render the condition inoperable.

One point I would like to make is that the location of a mass, which is apparently in the region of the hilus, cannot be determined positively from a single postero-anterior radiograph and its location may not be obvious even from stereoscopic films. Lateral or oblique films, or both, are indicated in all cases of a suggestive mass in the chest. A mass which appears to be in the hilus on a postero-anterior film may be and often is in the apical segment of the lower lobe or in the anterior segment of the upper lobe.

Evidence of lesser degrees of atelectasis, associated with lesions affecting smaller bronchi or at an earlier stage of disease in larger bronchi, is of great importance if the early diagnosis of bronchogenic carcinoma is to be made.

The evidence of lesser degrees of atelectasis, or of total atelectasis of small extent, have been particularly well set forth by Robbins, Hale and Merrill[1], who state: "Of particular importance in these lesser degrees of atelectasis is the finding of change in the appearance and position of the hilar shadows, change in the arrangement of the vascular shadows in the periphery of the lung and change in the position and contour of the lobar septa". In many instances these signs of atelectasis are of more importance than mediastinal shift, elevation of the diaphragm or narrowing of interspaces. In fact, in many instances of relatively major degree of atelectasis the secondary signs only may be present, as the surrounding lung may, by relative over expansion, entirely compensate for diminished lobe or lobular volume, so that there may be definite and even moderately large areas of atelectasis unassociated with mediastinal shift, elevation of the diaphragm or narrowing of the interspaces. Of particular value to us have been the findings of displacement of fissures and relative diminution in the number of broncho-vascular markings, or fanning out of markings in the area of overdistended lung not involved in the atelectasis. The finding of localized emphysema, due to checkvalve action of an intrabronchial tumour, is valuable but, in our opinion, is a less frequent finding than those above noted.

The further radiological investigations of laminagraphy and bronchography are capable of playing a very important role in the detection and differential diagnosis of earlier bronchogenic lesions.

If bronchoscopy is to be done, we feel that it should be done before bronchography, as in many cases it will obviate the necessity of doing bronchography by giving positive proof of carcinoma. The same is not true of laminagraphy. As this procedure in no way embarrasses the patient and carries no risk, it may obviate the necessity of doing bronchoscopy or bronchography, as it may show that the lesion is beyond the reach of the bronchoscope and render bronchoscopic examination unnecessary. It may reveal characteristic changes of carcinoma, rendering bronchography unnecessary.

Laminagraphy will, not infrequently, reveal cavitation in lesions in which cavitation was previously unsuspected, and or may show tortuous or irregular bronchial filling defects which are characteristic of carcinoma. It is also frequently possible to demonstrate complete bronchial occlusion by this means. We have found it of definite value in the demonstration of enlarged paratracheal glands, as an indication of metastatic spread of a bronchogenic carcinoma. It, also, frequently shows a lesion which appears to have a hazy outline in plain films due to over-lying air-containing lung, to be actually a homogeneous mass with relatively sharp borders; in other words, a peripheral solid carcinoma with little or no associated atelectasis.

In bronchography, well done, we have in our hands one of the most useful tools in determining the character of pulmonary densities and in establishing their bronchial or extra-bronchial origin, even in relatively small peripheral lesions. I use the term "bronchography well done" advisedly. Bronchography is, or should be, a highly specialized procedure, carried out by a radiologist under good conditions. The simple running of some Lipiodol into a right or left main bronchus and then making 14" x 17" films, or the worse procedure of injecting Lipiodol into the trachea and letting it run into both lower lobe bronchi, does not, in our opinion, constitute proper bronchography. Considerable controversy has existed as to whether the opaque contrast media should be introduced by the simple supraglottic route or by means of intra tracheal or intra-bronchial catheter or by means of tracheal puncture. I do not feel that it is of fundamental importance how the Lipiodol is introduced into the right or left main bronchus. I consider much more important what is done with the Lipiodol after one gets it into the main bronchus. In our opinion, the criterion of a good bronchogram is that every bronchus of every lobe shall be outlined and that only one side shall be done at one time. We feel very definitely that this can best

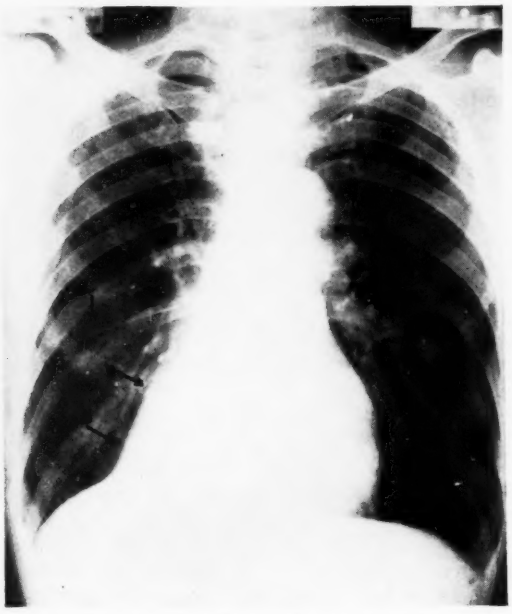
be done by conducting the examination on a radiographic tilt table, provided with the proper spot film device and under fluoroscopic control, to tilt the patient into proper positions and successively fill the major bronchi of all lobes of one lung at one sitting. If both sides of the chest are to be examined, an interval of a week or ten days should be allowed before the attempt is made to dot the remaining side, to allow clearing of most of the lipiodol from the first lung examined. This causes some delay but this has been more than offset by the results obtained, by avoiding confusion of overlying bronchi of the two lungs, as seen in oblique and lateral projections.

The following cases illustrate the above points.

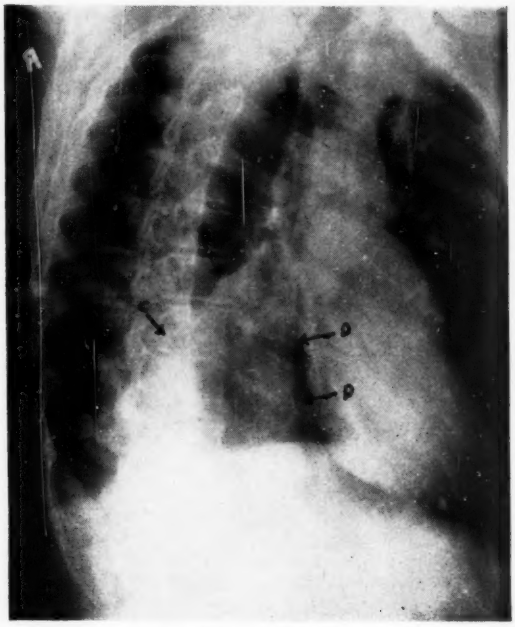
Case I—Mr. A. C., December 1948—Age 70

The patient first had haemoptysis seventeen months ago and has had four or five attacks of haemoptysis between that time and his present admission to hospital. He has had a dry cough for several months but no weight loss. Postero-Anterior films (Fig. 1A) show a triangular basal shadow in the right chest with no gross elevation of the diaphragm and no remarkable degree of mediastinal shift. There is, however, depression of the secondary fissure and marked fanning out of the bronchi in the right upper and middle lobes, due to compensatory overdistension of these lobes. Right anterior oblique films (Fig. 1B) show very clearly the location of the totally atelectatic right lower lobe. Bronchoscopic examination showed a tumour of the right main bronchus, $3\frac{1}{2}$ cm. below the main carina. Biopsy - squamous carcinoma.

This case illustrates very well the fact that total lobar atelectasis may be present without gross elevation of the diaphragm or mediastinal shift or narrowing of interspaces and that the space normally occupied by the collapsed lobe may be filled by over-distension of the remaining lobes of the lung.



CASE I — Fig. 1A



CASE I — Fig. 1B

Case I — BRONCHOGENIC CARCINOMA

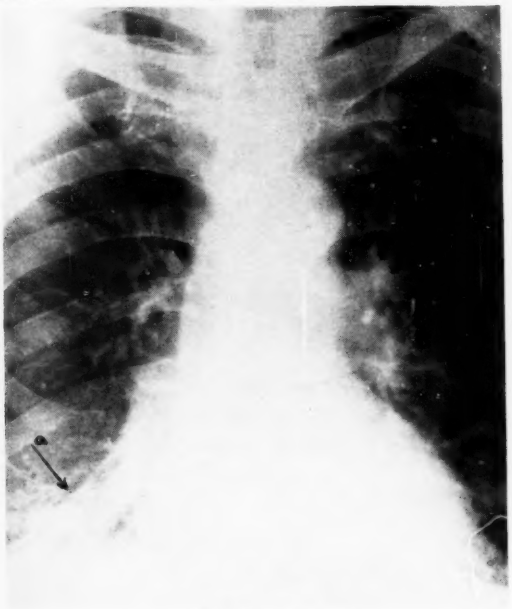
Fig. 1A—Postero-anterior film shows a triangular basal shadow due to total atelectasis of the right lower lobe. The great fissure line is indicated by arrows at (b) and the depression of the secondary fissure at (a). Note also depression of hilus, fanning out of bronchial markings, no elevation of diaphragm and little, if any mediastinal shift.

Fig. 1B—Left anterior oblique film shows totally atelectatis right lower lobe between arrows (c) and (d). Upper limb of great fissure indicated by arrow (c). Lower limb of great fissure indicated by arrow (d).

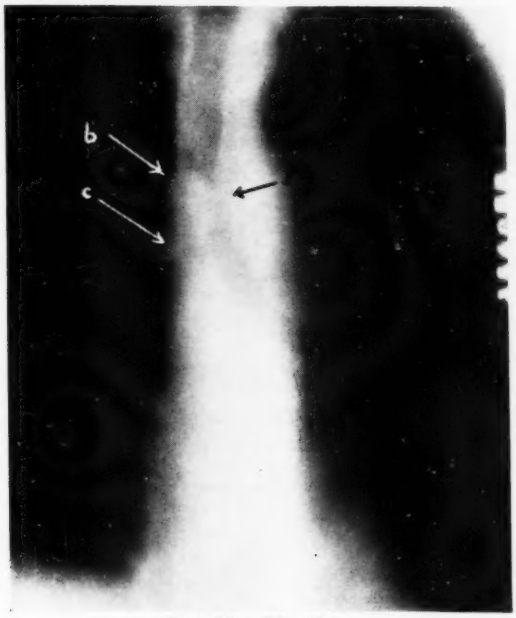
Case II—Mr. G. E., July 1949—Age 51

The patient had quite marked dyspnoea for three months and an acute attack of dyspnoea with haemoptysis just prior to admission. There was a weight loss of 40 lbs. in four months. Plain Postero-anterior chest film, 21 July 1949, (Fig. 2A) shows a density in the right lung base without evidence of atelectasis. Laminagraph made the following day (Fig. 2B) shows a tumour mass, arising from the right border of the trachea just above the carina projecting into the lumen and extending over almost to the left lateral tracheal wall. Radiological opinion was carcinoma of the trachea, the shadow in the right lung base being due to haemorrhage.

Bronchoscopy revealed a mass, as shown. The patient was operated upon and the pathological report was squamous cell carcinoma. This case shows very clearly the value of laminagraphy in tracheal and main bronchus lesions.



Case II — Fig. 2A



Case II — Fig. 2B

Case II — BRONCHOGENIC CARCINOMA

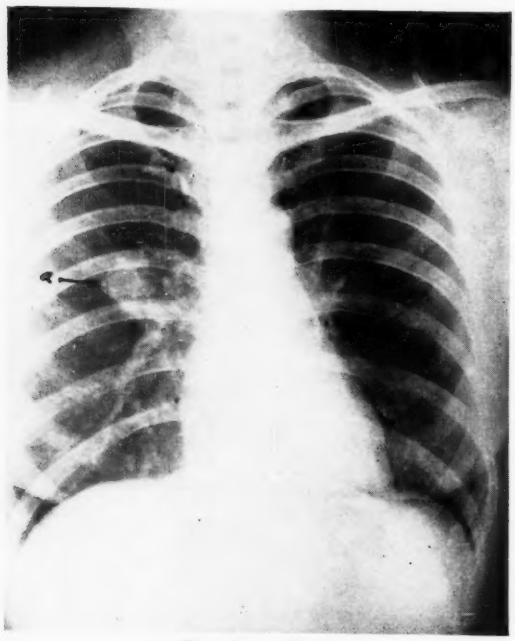
Fig. 2A—Postero-anterior film shows density in right lower lobe, indicated by arrow (a), due to aspirated haemorrage from lesion in trachea.

Fig. 2B—Laminagraph of centre portion of chest shows a carcinomatous mass, arising from tracheal border (b) and extending down to the right main bronchus at (c) and projecting into the lumen of the trachea. (d) indicates markedly narrowed lumen of the trachea.

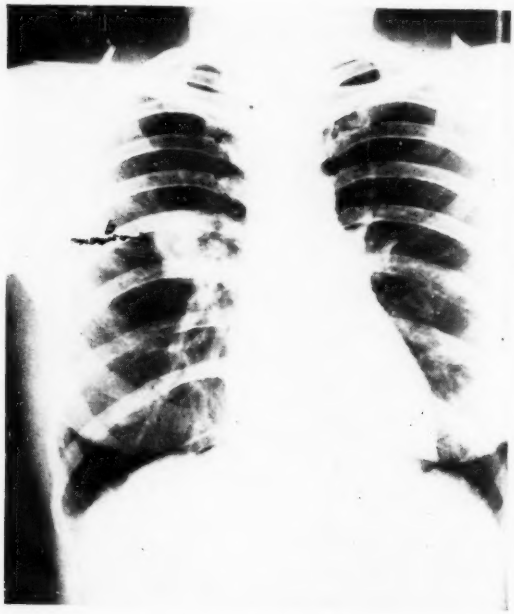
Case III—Mrs. P. M., July 1947—Age 46

This patient had her first X-ray on 22nd November 1945, made in another institution (Fig. 3A), at which time there was found a homogeneous density in the right lung at the level of the third rib anteriorly, although, as plain films only were made, one cannot be certain of its antero-posterior location in the chest. There were no associated calcified glands and no demonstrable evidence of atelectasis. Her second X-ray, made on 28th February, 1946, three months later, showed little, if any demonstrable change. Subsequent films in September 1946 showed a slight increase in the size of the lesion and slight sharpening of its outline. During this time she was having an irritable cough. There was no appreciable amount of sputum. There was some retrosternal pain. She was followed with watchful waiting, with further plain films in June 1947 (Fig. 3B), no lateral film being taken, until 8th July 1947, at which time a bronchogram was done, twenty months after the first chest film. The bronchogram (Fig. 3C and 3D) shows occlusion of the anterior branch of the upper lobe bronchus and a homogeneous mass in the right upper lobe, limited inferiorly by the secondary fissure and presenting the characteristic appearance of bronchogenic carcinoma. Bronchoscopy was negative in this case. The patient had a pneumonectomy and the lesion was found to be bronchogenic carcinoma.

The point, to be learned from this case is that, in any pulmonary lesion in which tuberculosis appears unlikely or tumour possible and in which the lesion does not disappear or change markedly in one month, further investigation should be carried out and that the thought of carcinoma should always enter the differential diagnosis. It also shows the value of bronchography in cases of suspected bronchogenic carcinoma.



Case III — Fig. 3A

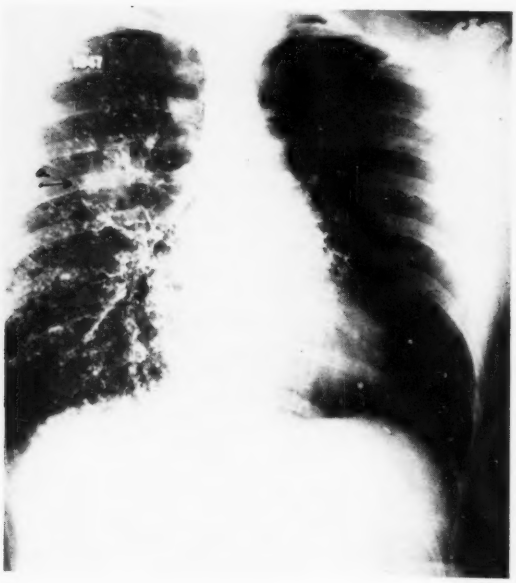


Case III — Fig. 3B

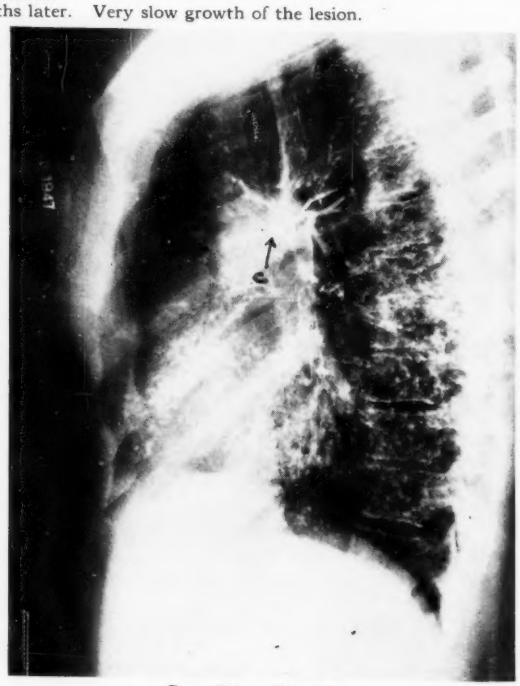
Case III — BRONCHOGENIC CARCINOMA

Fig. 3A—Film made elsewhere on 22 November 1945 shows a mass in the right upper lobe, immediately above the secondary fissure, which was thought to be tuberculous.

Fig. 3B—Film shows the same mass on 28 June 1947, 19 months later. Very slow growth of the lesion.



Case III — Fig. 3C



Case III — Fig. 3D

Case III — BRONCHOGENIC CARCINOMA

Fig. 3C—Postero-anterior bronchogram film shows the mass with no lipiodol filling the area.

Fig. 3D—Right lateral film shows the mass, indicated by arrow (d), and bronchial occlusion at arrow (c). The bronchus so occluded is the anterior division of the upper lobe bronchus.

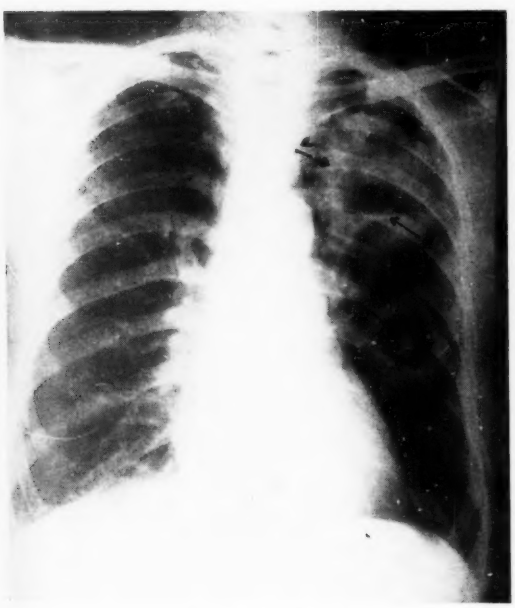
Case IV—Mr. R. R., October 1946—Age 55

One year before admission, while at work, this patient had a sharp pain in the left chest and was off work for one week. He has had similar pain almost daily in the left chest since that time. Lately, he has tired readily, is unable to work full time and has lost 35 lbs. in weight. One month before admission, he had a severe pain in the left chest which was treated as coronary disease. On admission, he was acutely ill and dyspnoeic with restricted chest movement on the left. Postero-Anterior and lateral films of the chest (Fig. 4A and 4B) show a large abscess cavity in the left upper lobe with a fluid level and with rather irregular walls internally and fairly sharp demarcation of the abscess wall externally. Bronchoscopy was not done in this case. Laminagraph (Fig. 4C) shows occlusion of the two branches of the apical bronchus on the left side and a filling defect in the bronchus. The bronchogram (Fig. 4D) confirms this finding, showing a large mass in the apex of the lung with a filling defect in the apical bronchus and bronchial occlusion. The radiological opinion was bronchogenic carcinoma with abscess. Thoracotomy was performed, revealing a large infiltrating carcinoma in the left lung, invading the chest wall. The lesions was inoperable. Biopsy showed squamous cell carcinoma.

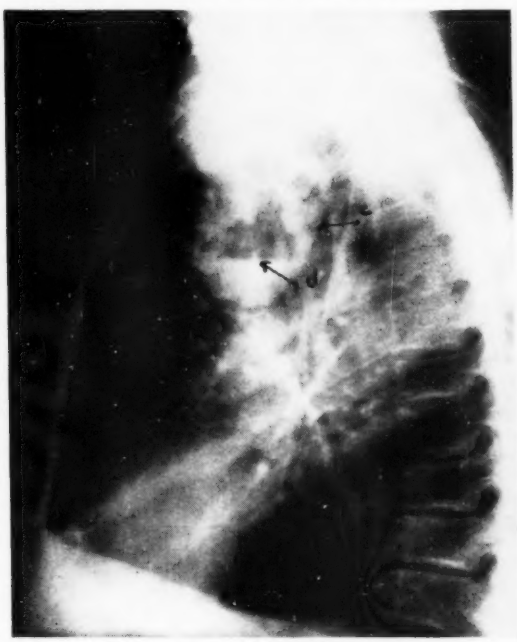
The point which would seem to be important in this case is that the onset of symptoms of carcinoma can simulate pneumonia and that carcinoma can be confused with lung abscess. One of the differential points between inflammatory and malignant lung abscess is the thickness and irregularity of the wall of the lesion in carcinomatous abscess. This case also illustrates the value of laminagraphy and bronchography.

Case V—Mr. M. S., December 1938—Age 54

The lesion in this patient's right lung was picked up by a routine chest X-ray in August 1948. There was no history of cough or sputum and it was an entirely accidental finding. The patient was well. Plain Postero-anterior and lateral films (Fig. 5A and 5B) show a lesion in the anterior segment of the right upper lobe, in which the outstanding feature is that of a mass which extends down to and is sharply limited by the secondary fissure. There is no obvious atelectasis and no mediastinal shift. The appearance would suggest a solid bronchogenic carcinoma without gross associated atelectasis. Laminagraph films (Fg. 5C and 5D) show a mass, irregular in outline but with sharply circumscribed borders. In the centre of the mass is the outline of anterior bronchus which presents narrowing of lumen and irregularity of outline.



Case IV — Fig. 4A



Case IV — Fig. 4B

Case IV — BRONCHOGENIC CARCINOMA

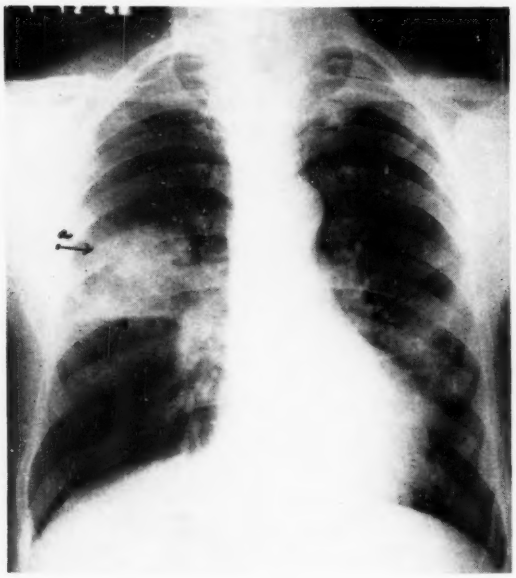
Fig. 4A—Postero-anterior view of the chest shows a large area of consolidation in the left upper lobe at (a), sharply outlined from surrounding lung with irregular thick walled cavity and fluid level at (b).

Fig. 4B—Lateral projection shows the mass and cavity with fluid level in the upper lobe.

Case IV — BRONCHOGENIC CARCINOMA

Fig. 4C—Laminagraph shows obstruction of the two major branches of the apical bronchus of the left upper lobe. The sharp borders of the mass are well shown at (a) and the occluded apical bronchus at (b).

Fig. 4D—Bronchogram shows bronchial occlusion outlined by lipiodol with filling defect at (d). The mass is clearly outlined (c). This is a typical carcinomatous abscess.



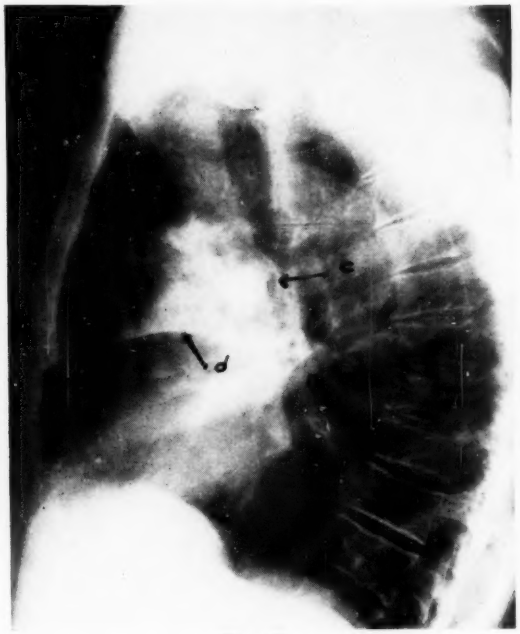


Fig. 5A

Fig. 5B

Case V — BRONCHOGENIC CARCINOMA

Fig. 5A—Postero-anterior film shows mass in the right upper lobe at (a), sharply limited inferiorly by the secondary fissure at (b). Note the absence of mediastinal shift, elevation of the diaphragm or narrowing of interspaces. The shadow is due mainly to solid tumour rather than to atelectasise.

Fig. 5B—Right lateral view shows the tumour mass (c) extending down to the secondary fissure (d) and involving the anterior segment of the right upper lobe. Note that there is no elevation of the diaphragm and no displacement of the fissure.

The radiological opinion was bronchogenic carcinoma. Bronchoscopic examination was negative. A right pneumonectomy was performed. This showed adenocarcinoma of the anterior segment of the right upper lobe. There was little associated atelectasis. The mass seen in the gross specimen was a carcinomatous mass, corresponding in size and shape to the shadow seen in the films.

The points illustrated in this case are: first, the finding which was shown in one of the other cases, that is, the size to which a carcinoma can attain without production of symptoms. It also illustrates the size of a lesion in the upper lobe in which bronchoscopy may be negative. This case also illustrates the value of laminagraphy in selected cases.

Case V — Fig. 5C

Case V — Fig. 5D

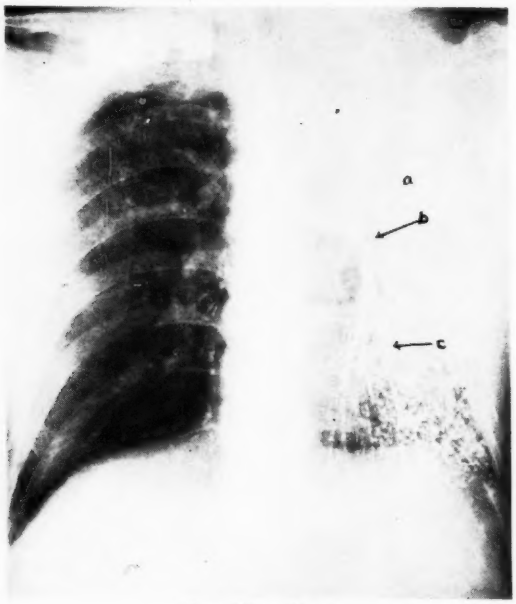
Case V — BRONCHOGENIC CARCINOMA

Fig. 5C and 5D are two laminagraph cuts of the lesion. Note the fairly sharp outline of the tumour mass at (a) and (d) and the distortion of and filling defect in the anterior bronchus of the right upper lobe (c) and (b), indicating the secondary fissure.

Case VI—Mr. A. H., September 1947—Age 56

The patient is well and looks well. He reported to his doctor because of hoarseness. He had no symptoms, except some loss of weight, no restriction of activities and no dyspnoea nor other evidence of serious disease. Physical examination showed dullness and diminished air entry with harsh breath sounds over the left upper chest. Bronchoscopic examination was negative. Bronchogram, following plain films, (Fig. 6) shows complete obstruction of the upper lobe bronchus, including the lingular bronchus, a solid dense shadow over the left upper chest, gross mediastinal shift to the left and a filling defect in the left main bronchus in the region of the origin of the upper lobe bronchus. The findings are characteristic of bronchogenic carcinoma.

The points to be learned from this case are: that, not infrequently, it is a complication of bronchogenic carcinoma which brings the patient to the doctor. In this case, it was hoarseness due to involvement of the left recurrent laryngeal nerve. It is also an indication of the limitations of bronchoscopy in upper lobe lesions. It also, of course, shows the value of bronchography in bronchogenic carcinoma.



Case VI — Fig. 6

Case VI — BRONCHOGENIC CARCINOMA

Fig. 6 — Postero-anterior bronchogram film shows gross mediastinal shift to the left, no elevation of the left diaphragm. Totally atelectatic upper lobe (a). Carcinomatous filling defect at (b) with total occlusion of upper lobe bronchus, including the lingular bronchus. (c) indicates the bronchi of the lower lobe.

CONCLUSIONS

(1) From the above considerations, it is felt that the radiologist has two primary responsibilities with regard to improving the results of treatment of bronchogenic carcinoma. The first of these responsibilities is to regard with suspicion all pulmonary lesions, other than those obviously not carcinomata, which do not completely disappear or are markedly improved after an interval of one month. The fact that the patient is under 50 years of age should in no way influence this opinion. The second responsibility is to be prepared to investigate thoroughly by laminagraphy or bronchography, or both all cases which raise suspicion of bronchogenic carcinoma.

(2) There is a considerable group of cases of carcinoma of the bronchus in which bronchoscopy is negative. This group may be from 25 to 40 per cent. It is in this group of upper lobe and peripheral carcinomas that the radiologist has a particularly grave responsibility in the investigation of pulmonary lesions. Laminagraphy and bronchography are of great value, particularly in upper lobe and peripheral lesions.

(3) It is obvious that chest surveys are a very fertile field for the discovery of early bronchogenic carcinomas. It, therefore, becomes the duty of all radiologists and all others seeing survey films, to be particularly cancer-minded. They must see, insofar as they can, that all abnormal cases are investigated, in order to discover earlier bronchogenic cancer and so help to reduce the high mortality rate of this disease.

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RETICULUM CELL SARCOMA OF THE RIB*

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The multiplicity of case reports in present day literature dealing with pathological states, in the light of roentgen interpretation, brings to our realization the futility of making diagnostic statements and so-called dogmatic or "iron clad" diagnosis.

Since man is not a machine and does not exhibit all the classical features supposed to exist in certain pathological conditions, certain clinical entities test the judgment and skill of trained observers requiring all the faculties available not only to arrive at a correct opinion but more important still, to determine the best procedure to further the interest and well-being of the patient.

There comes a time, in the radiological life of all of us, when an unusual and perplexing pathological state is recognized, which, in itself acts as a supreme challenge to test our knowledge and ingenuity in order to arrive at an intelligent diagnosis. This becomes a bright star on the horizon, making us forget, for the time being, the "garden variety" type of case seen in the modern busy radiological practice.

The writer makes no apology in presenting this paper under its given title nor with the assumption that it is a "cut and dried" case report, but chiefly for the purpose of stimulating discussion, and by so doing add more valuable information than that embodied in the paper itself.

Those of us who have had the opportunity of studying a number of bone tumours have come to realize that there is a certain amount of truth in the dictum by Macdonald and Budd to the effect that a fixity of radiological pattern does not exist. In their opinion the roentgen-ray study of bone tumours affords an interpretation of the activity of the neoplasm and equally of the character of the stromal response. Thus the appearance of a bone tumor at a given time depends on the balance between neoplastic activity and the degree of cortical and medullary reaction, as well as the absence or extent of calcification and ossification.

We are all aware that the proper interpretation of lesions involving the osseous system requires familiarity with its physiology and pathology. We know that in general a lesion (inflammatory, neoplastic or otherwise) may be confined to a component of bone or a portion of bone, or may involve all or several elements of that bone. The characteristics of the lesion have to be weighed and evaluated, several conditions considered, differentiated and excluded before arriving at a diagnosis. A careful survey of the history and clinical findings is necessary; comparative radiographs of the affected and unaffected sides, as well as repeated examinations of the distal and nonskeletal regions, are required.

It is the purpose of this report to present a brief outline of what is known concerning reticulum cell sarcoma, illustrated by a patient with this tumor, diagnosed as such by microscopic examination.

Parker and Jackson, as reported by Coley[1], first described the condition as a specific disease entity. It is a relatively rare tumor as shown by the fact that their communication included only 17 cases collected from three large Boston hospitals. A search of the literature since 1939 disclosed only four papers written on the subject.

Reticulum cell sarcoma appears in either long or flat bones. The majority involve the shaft of the long bones, particularly the metaphyseal portions, although like Ewing's sarcoma, they may extend into the diaphyseal area.

The lesion is osteolytic, destroying the cortex. Such new bone as produced is reactive rather than tumor bone. Growth is rapid, metastases take place to the lungs and less frequently to the lymph nodes.

The tumor arises from the bone marrow reticulum, an essential part of the so-called reticulo-endothelial system. The reticulo-endothelial cells are most numerous in lymph nodes, the spleen, the liver, and the bone marrow. In the case of bone, they line the sinuses of the marrow and possess phagocytic properties essentially similar to those found in the lymph nodes, spleen, liver and other portions of the body.

Reticulum cells have various capacities for development, and correspondingly various cell types have been identified in tumors thought to originate from them.

In the opinion of many authorities, Hodgkin's disease is a malignant tumor of reticulum cells and is thus considered to be closely related to reticulum cell sarcoma.

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Reticulum-cell sarcomas arising from the reticulum of lymphoid tissue are not rare; however their counterparts arising from the reticulum cells of bone marrow are uncommon. Previous to 1939, when Parker & Jackson[2] drew attention to them, for the most part they were diagnosed as Hodgkin's sarcoma of bone, Ewing's sarcoma, etc. Since that time they have emerged as a distinct tumor entity with certain distinctive characteristics about their clinical course. Bennett[3] observes that the patients affected by this disease may remain in comparatively good health even after the tumor has reached a large size. This will be noted in the case reported by the writer (H.R.C.). Bennett further observes that the tumor may become quite extensive locally before metastatic dissemination occurs.

The gross appearance of the tumor varies considerably—the growth is at first confined to the marrow cavity which contains a pinkish-grey mass. In more extensive cases the neoplastic tissue involves the cortex of the bone and by invasion extends into the soft tissues. Areas of necrosis are frequent in the resulting large, poorly defined, firm flesh-colored mass.

The case * I wish to present is that of a white male, soft coal miner, aged 52, admitted to the surgical service of St. Joseph's Hospital, Glace Bay, Nova Scotia, on January 15th, 1950.

His complaints on admission were lumps on chest wall, skull and loin.

Past history was that of good health until three years ago when he happened to notice a painless swelling on the left side of the chest approximately two inches below the clavicle. At that time he was seen in the outpatient department and referred for radiological investigation.

Radiographic studies at that time showed a homogeneous density occupying the lower half of the upper-third of the left lung field. Detail studies revealed a destructive process involving the anterior extremity of the 2nd rib associated with circumscribed tumor formation. Our tentative opinion at that time was that of a chondroma arising from the cartilaginous end of the rib. A strong recommendation for biopsy was made. This unfortunately was never accomplished, and the patient was lost sight of.

He was not seen again by his physician until January, 1950, when he complained of additional swelling in the left loin and scalp of approximately three months' duration. In the interim he had been working steadily, and there were no constitutional complaints.

*Courtesy of Dr. M. G. Tompkins, Dominion, Cape Breton.

Physical examination disclosed a well-developed male of stated age without apparent loss of weight; nutrition appeared satisfactory. The chest wall presented an irregular mass about the size of a grapefruit, fairly hard and not particularly tender, located immediately below the left clavicle and apparently attached to the anterior extremity of the 2nd rib. The swelling affecting the scalp was in the midline, anteroparietal area, slightly movable and fluctuant. In addition to the above, a hard mass was discovered apparently adherent to the anterior extremity 11th rib left thoracic cage. Examination of the left inguinal region disclosed a swelling about the size of a golf ball similar to glandular enlargement.

This patient was referred initially on admission for study of the thoracic cage and lungs. The original site examined three years ago showed very little bone change, there was appreciable increase in soft tissue density indicating slight tumor enlargement.

Details studies of the 11th rib showed a trabeculated, rather oval, expansive growth having an appearance not unlike a plasmocytoma. (This was the area selected later for biopsy.)

On the lateral film of the thoracic cage a localized destructive areas was discovered affecting the body of the sternum. As this presented the appearance of a metastatic lesion, the diagnosis now pointed to a malignant bone tumor. Subsequent roentgenograms of the skull showed an extensive osteolytic lesion involving both cranial tables.

We were, at this stage, in somewhat of a dilemma. Had the original tumor of the 2nd rib, of three years' duration, undergone sarcomatous degeneration with resultant metastatic involvement of the sternum, the 11th rib and the inguinal gland? Was the original lesion still bening, and that of the 11th rib malignant?

By means of a surgical biopsy carried out following the provisional diagnosis of malignant neoplasm involving the 11th rib, the contiguous site was exposed and a portion of tumor tissue removed.

The tissue was examined by Dr. J. H. Fodden, Associate Provincial Pathologist, Nova Scotia Provincial Laboratories. The type cell had many histological variants and generally occurred in sheets. The tissue, however, was definitely sarcomatous and the cell type suggested derivation from reticulum, (Fig. 2) with numerous reticulum fibres enmeshing the malignant cells.

The pathologist reported further: "The gross and histological appearance shows a plum-sized portion of tissue which has the characteristics of

Fig. 1

Fig. 2

a reticulum-cell sarcoma. Special staining techniques (Wilders) verified this diagnosis (Fig. 2). It is impossible to say whether this tumor originated in the lymph nodes of the deep cervical chain or whether it came from the reticulo-endothelial structures in cancellous bone of rib."

X-radiation was advised but this was not carried out; the patient wished to return to his work inasmuch as he was feeling comparatively well. The patient was discharged from hospital ten days after admission. A recheck film examination of the skull was carried out in August of this year. This showed a progressive destruction of the vault. Death occurred at home late in September—no autopsy was performed.

SUMMARIZATION

A brief review of the available literature on the comparatively rare condition *reticulum-cell sarcoma* has been given with a case report of such a tumor primarily arising in a rib.

A case report presenting many complexing factors. The diagnosis has been finalized by biopsy. Post-mortem examination was not available.

Authoritative information suggests that the tumour might well have shown response to x-radiation.

An object lesson to be gained from this case is that we should stress the desirability for the closest collaboration between the surgeon, the pathologist and the radiologist, and the necessity for a "follow up" examination in all instances in which the diagnosis is obscure or opinion not substantiated.

RESUME

L'auteur donne un aperçu des tendances de la littérature actuelle concernant les réticulo-sarcômes.

Il relate un cas particulièrement complexe où le diagnostic histologique a été fermement établi et où la radiothérapie aurait pu vraisemblablement aider le malade.

L'auteur insiste sur les avantages de la collaboration entre le chirurgien, le pathologiste et le radiologiste, et sur la nécessité des examens de contrôle répétés dans les cas où le diagnostic reste imprécis.

EDITOR NOTE:—The original roentgengraphs of this case were apparently lost in transit, preventing full illustration. Dr. Corbett's paper has been published, therefore, with only the photomicrographs.

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TUMEURS RECTALES DE MALIGNITE DOUTEUSE

A PROPOS D'UNE OBSERVATION PERSONNELLE

par

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Quatre-vingt pour cent des cancers du rectum sont des épithéliomas cylindriques. Dans la portion inférieure de l'ampoule rectale et dans la région sphinctérienne, on trouve aussi assez communément des épithéliomas pavimenteux. Ce sont alors, en règle générale, des formes spino-cellulaires, provenant soit de l'épiderme anal, soit d'une métaplasie de la muqueuse rectale (Ewing). Le diagnostic histologique et clinique de ces cancers s'effectue sans difficulté. Tous relèvent de la chirurgie, à part certaines tumeurs anales, où le traitement de la localisation primitive peut, dans le cas d'une forme épidermoïde, bénéficier plus ou moins des radiations.

Il n'en va pas de même de certains cancers rares du rectum, à malignité mal fixée, où on reste perplexe devant l'alternative de pratiquer inutilement une mutilation grave, ou de se confiner à des traitements conservateurs exposant à une évolution fatale.

C'est à propos d'un cas de ce genre qu'il nous est venu à l'idée de nous documenter sur la question.

Madame H. C. . ., nous est adressée le 19 mai par son médecin de famille. Un diagnostic d'épithélioma baso-cellulaire de l'ampoule rectale a été posé et confirmé (Beaulieu, Riopelle). La rectoscopie a été pratiquée par le Dr Roland Gareau qui a bien voulu nous communiquer les détails suivants: "A l'extrémité supérieure du canal anal, dans le quadrant antérieur droit, masse à surface granuleuse et saignottante, du volume d'une olive. La lésion est partiellement recouverte par un repli de la muqueuse. L'infiltration des tissus avoisinants ne parait pas considérable. Impression clinique d'un adénôme" Le médecin de famille nous demande si, étant donnée la forme histologique particulière de la lésion, la radiothérapie ne pourrait pas remplacer la chirurgie.

Il s'agit d'une femme de 55 ans, souffrant, depuis plusieurs années, de constipation, et ayant présenté ces derniers temps des symptômes qui évoquent, à première vue, le tableau de la fissure anale si magistralement tracé par Forgue. Les douleurs qui accompagnent et qui suivent la défécation sont telles, que cet évènement est devenu le souci principal et la hantise de la journée. Onguents, suppositoires, laxatifs et bains de siège sont utilisés en pure perte. L'affection laisse de temps en temps de courtes périodes d'accalmie relative, pour réapparaître de plus belle.

Au toucher rectal, on perçoit, du côté droit, à deux ou trois centimètres au-dessus de l'anus, un bourrelet induré à grand axe vertical, de trois centimètres de longueur par deux de largeur et un d'épaisseur. La surface est rugueuse et légèrement anfractueuse à l'endroit biopsié. Il y a un peu d'infiltration de la région sphinctérienne. Il n'y a pas de ganglion dans les aînes.

Le traitement par les radiations a commencé le 19 mai. Nous avons jugé que le procédé le plus commode et le plus sûr était la roentgenthérapie profonde. Nous avons écarté l'idée d'une sonde radifère à cause de la répartition brutale et aveugle des radiations, inhérente à cette méthode.

Tension constante: 220 Kv. Filtration de 2 mm. de Cu. et 2 mm. d'Al. Un champ anal circulaire de 5 cm. de diamètre, irradié à 50 cm. de distance. Un champ vulvaire de 6 x 8 cm. irradié à 80 cm. Un champ sacrococcygien de 6 x 8 cm., irradié à 80 cm. de distance. La dose totale distribuée sur les 3 champs a été 8 000 r. (mesurés dans l'air). Le traitement a été donné en 7 semaines. Au début d'août, tous les troubles fonctionnels étaient définitivement disparus. Actuellement, on ne trouve plus à l'endroit de la lésion qu'une mince cicatrice souple.

On connaît au moins deux formes de cancer ano-rectal où la malignité doit faire l'objet de certaines réserves: ce sont le *carcinoide* et *l'épithélioma baso-cellulaire*. Il faut convenir que ces lésions sont rares et de connaissance récente. Les traités courants ne parlent pas de l'épithélioma baso-cellulaire, et ceux antérieurs à 1940, passent sous silence, ou mentionnent à peine les carcinoïdes du rectum. La littérature actuelle compte environ une dizaine des premiers et une quarantaine des derniers.

Le terme de *carcinoide* serait attribuable à Oberndorfer (1907). Les premiers observateurs auraient apparemment interprété cette tumeur comme un épithélioma baso-cellulaire. Lubarsch en 1888, l'a définitivement isolée des adénocarcinômes ordinaires. L'histoire des carcinoïdes est aujourd'hui inséparablement liée aux travaux de Masson, qui en fixent les caractères anatomo-pathologiques et en fournissent un commencement d'interprétation.

Un des attributs principaux des carcinoïdes (qui justifie leur nom) est de *présenter des signes histologiques de malignité, tout en restant, dans la majorité des cas, de faible volume et sans métastases*. Masson cite l'opinion d'un pathologiste allemand qui considérait les carcinoïdes comme des naevi de la

muqueuse intestinale. L'analogie est en effet frappante sous bien des rapports, et surtout sous celui du caprice à métastaser.

Les carcinoïdes peuvent se rencontrer sur tout le tube digestif sous-diaphragmatique. Leur siège par ordre de fréquence est l'appendice, l'iléon, le jéjunum, le rectum, le coecum et le colon ascendant, le colon transverse, le colon descendant et l'estomac. Ces tumeurs seraient, d'après Masson, non pas des épithéliomas d'emblée, comme on a généralement tendance à se les représenter, mais des hyperplasies ou des néoplasies (?) adénomateuses bénignes, susceptibles dans des circonstances relativement rares, de se cancériser. L'adénome en question serait un adénome un peu particulier, de type endocrinien, étroitement relié au système nerveux sympathique. L'élément tumoral fondamental y serait une cellule identique, ou analogue aux cellules de Kulschitsky de l'épithélium intestinal. On parviendrait plus ou moins régulièrement, suivant les techniques utilisées, à y mettre en évidence de fines granulations protoplasmiques à propriété argentaffine. D'où le nom de *tumeurs à cellules argentaffines* proposé par Masson.

Du point de vue clinique, il faut savoir que les tumeurs argentaffines les plus sujettes à se cancériser sont celles de l'intestin grêle, où elles représenteraient 23% (1) des tumeurs malignes de ce segment du tube digestif. Dans l'appendice, la bénignité est la règle. A ce dernier endroit, les carcinoïdes sont si communs que 0.5% de tous les appendices enlevés pour des conditions inflammatoires en contiendraient (2).

Les carcinoïdes du rectum qui nous intéressent directement ont fait l'objet d'importants travaux récents, parmi lesquels il convient de citer ceux de Stout, de Pearson et Fitzgerald et de Horn. Le dernier en date que nous avons consulté, celui de Horn (septembre 1949) mentionne 42 cas relevés dans la littérature.

Dans le relevé en question, nous trouvons cinq cas compliqués de métastases. Celles-ci se sont produites par ordre de fréquence, dans les ganglions lymphatiques, le foie, les poumons, le squelette, le rein, la rate, la thyroïde, les surrénales et le pancréas. L'âge des malades atteints de carcinoïdes du rectum a varié de 18 à 71 ans. Le sexe n'a pas d'influence sur la fréquence. Ces tumeurs sont le plus souvent muettes dans le domaine des troubles fonctionnels: On signale exceptionnellement un peu de sang dans les selles et des troubles de la défécation. La cancérisation parait être l'apanage des sujets plutôt âgés.

La lésion se présente comme une tumeur étalée, sessile ou pédiculée, dépassant rarement le volume d'un haricot, s'insérant sur une base souple et laissant le plus souvent la muqueuse indemne. L'induration des tissus avoisinants doit laisser soupçonner une lésion maligne. Neuf fois sur dix, la tumeur est solitaire. Dans dix observations où la distance du sphincter anal a été notée, on relève 5 cas à 5 cm., 2 à 4 cm., 1 à 10 cm., 1 à 8 cm. et 1 à 2 cm. A la section, la tumeur présente une coloration blanchâtre, jaunâtre ou orangé.

Stout a signalé, dans certains carcinoïdes rectaux, une structure histologique assez caractéristique "en rubans de cellules cylindriques disposés en festons". L'auteur a contribué à fixer la proportion de carcinoïdes réfractaires aux méthodes courantes d'imprégnation argentique et en a tenté une explication qui n'entre pas dans le cadre de ce travail. Il a formellement affirmé aussi que l'histologie ne permet pas, pour le moment, de distinguer les carcinoïdes aptes à métastaser de ceux qui ne le sont pas.

Le traitement des carcinoïdes a été maintenant exclusivement chirurgical. *Il doit être, en règle générale, d'autant plus conservateur que le sujet est plus jeune, et d'autant plus radical que le malade est plus âgé.*

On n'a encore jamais signalé de carcinoïde traité par les radiations. Nous ne savons pas si on a le droit, au point de vue radiothérapie, d'assimiler les tumeurs argentaffines aux mélanômes. Mais tous les mélanômes ne semblent pas mériter la traditionnelle radiorésistance qu'on leur attribue.

L'épithélioma baso-cellulaire du rectum représente un problème encore moins bien connu que celui des carcinoïdes. Tous les épithéliomas de l'anus seraient, à de très rares exceptions près, des spino-cellulaires. Lott et Alexander, qui ont fait un relevé de la littérature sur la question en décembre 1949, n'ont trouvé que 8 cas de baso-cellulaires rapportés sur cette localisation. Si on ajoute celui de Gross, publié en 1948, et qui semble avoir échappé à l'attention de Lott et Alexandre, on arrive à un total de 9 observations d'épithélioma anal baso-cellulaire.

Nous savons tous que les épithéliomas baso-cellulaires perdent leur bénignité relative lorsqu'ils se développent ailleurs que sur la peau. Les lésions buccales nous en fournissent assez fréquemment la preuve. Théoriquement, un baso-cellulaire du rectum devrait donc être assimilé à un spino-cellulaire. En fait, il semble bien qu'il n'en est pas tout à fait de même. Les cas d'épithélioma baso-cellulaire rapportés dans le canal anal ont guéri définitivement, avec des traitements relativement simples et conservateurs, lorsqu'on les a pris au début.

(1) D'après Dockerty et Ashburn. Cités par Pearson et Fitzgerald.

(2) D'après Dockerty et Ashburn. Cités par Pearson et Fitzgerald.

RESUME

A propos d'un cas d'épithélioma baso-cellulaire du rectum anal, traité avec succès par les rayons X, l'auteur passe en revue certaines tumeurs anorectales de malignité douteuse, où un traitement conservateur semble devoir être systématiquement tenté.

SUMMARY

With regard to a basal cell anorectal epithelioma treated successfully with X-Rays, the author points out certain anorectal tumors of doubtful malignancy, where a conservative treatment should be tried systematically.

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Nous ne citons que les quatre travaux les plus récents, Le lecteur trouvera dans ces derniers la liste des ouvrages parus antérieurement.

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MESENTERIC CYSTS — A CASE REPORT

par

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P. H. ROBERTS, M.D.

In October 1941 Mrs. R. a rather obese housewife, age 67, consulted one of us (P.H.R.) because of a pain below the right costal margin, which radiated around to the back. This pain had persisted for the past two years. She also complained of frequency (q. 2. h. during the day), increased thirst and chronic constipation.

There was no history of diarrhoea nor change in the character of her stools. On examination there was noted a blood pressure of 180/100. Her urine showed a trace of albumin but no sugar. A large, slightly tender mass was just palpable in the right upper quadrant of the abdomen. On further questioning the patient admitted that constipation had existed for some time and for relief she took three to four tablets daily (Aloin, Belladonna Extract, Strychnine Sulphate and Cascara Extract). The pain below her right costal margin was dull in character, was not relieved by anything that she knew or could do, such as removing her corset, and was constantly aggravating. She also stated that X-rays were taken in October 1939 when she was told that she had passed a kidney stone and had a tumour within the abdomen. Since these latter X-ray examinations the pain had not got any worse, but she had developed frequency of urination, which was relieved by "pills" prescribed by her physician.

The patient was admitted to the surgical service of one of us (J.J.G.) on October 13, 1941. Her blood pressure was then 224/122. There was a soft blowing systolic murmur at the apex of the heart with evident enlargement of the heart. Her urine showed specific gravity of 1012, no sugar, but a faint trace of albumin was present. On palpation over the abdomen there was noted again a mass about the size of a grapefruit in the right upper quadrant.

A single postero-anterior film of the abdomen was done and this showed a spherical mass in the right upper quadrant of the abdomen measuring 10 cms. on the film. The films of three previous X-ray examinations, taken in October 1939, were obtained. The gall bladder examination with dye was normal. The retrograde pyelogram showed no deformity due to compression of the tumour and the barium enema examination showed a spherical mass, measuring 10 cms. in diameter on the film, just distal to the hepatic flexure. The mass had not increased in size appreciably in two years. A portion of the proximal transverse colon showed a concave configuration corresponding to the shape and size of the tumour.

It was decided to do a gastro-intestinal examination and during this examination it was noted on fluoroscopy, that the 2nd and 3rd portions of the duodenum were displaced to the left. In the films taken of this area, the configuration of the duodenum conformed to that of a spherical tumour. A diagnosis of mesenteric cyst was made on the basis of a tumour which displaced both the proximal transverse colon and the 2nd and 3rd portions of the duodenum.

A laparotomy was done and just behind the hepatic flexture and proximal transverse colon a cystic mass was found about the size of a grapefruit. This could be felt within the peritoneal folds and when the mesentery was opened a cyst with a very thin wall was seen. When this cyst was partially enucleated it broke and was found to be filled with a clear fluid. After the fluid was aspirated and the major portion of the cyst excised, a second cyst came into view. An attempt was made to enucleate it also, but the wall was so thin that it also broke. Most of the wall of this cyst was excised. A soft rubber drain was inserted to the site of the cysts through a stab wound in the flank of the abdomen and the abdomen closed. The patient made an uneventful recovery and was discharged on the fifteenth day after operation.

A cyst of the mesentery is one of the rarer conditions seen in X-ray examinations. The first one was discovered at autopsy by Benevieni in 1507 and since that time over 600 cases have been reported. As estimated by Judd and Heimdal the occurrence is 1 in 100,000 cases and most of these are found in the mesentery of the small bowel and more frequently in women.

The surgical importance of mesenteric cysts is that they cause such complications as intestinal obstruction, due to pressure or torsion, peritonitis, and hemorrhage either into the cyst or into the peritoneal cavity. The presence of these complications makes the diagnosis difficult, if not impossible. Mesenteric cysts may be so small that they are not demonstrable, or so large that it is difficult at the time of operation to determine where the cyst arises. (Hinkel[1]; Beahrs and Judd[3].). However, with must uncomplicated cysts one should be able to determine the site and relationships by fluoroscopic and radiographic examinations. Palpation under the fluoroscope and films taken with the patient postured properly, if carefully done, should show the presence and the relations of almost all mesenteric cysts. The barium meal examination, the barium enema examination and a small bowel examination, either by meal or enema, are important in that they are the only forms of examination that furnish a preoperative diagnosis.

Mesenteric cysts may contain a fluid which is watery in consistency, chylous, greasy, or the cysts may contain considerable solid material. Rarely do they show radiographic evidence of calcification. Peterson[5] has given the following classification which seems to be the most favoured:—

1. Embryonic
   - A. Arising from embryonic remnants and sequestrated tissue. These may be serous, chylous, sanguineous or dermoid.
   - B. Cysts of intestinal origin arising as a result of:—
     - (1) sequestration from the bowel.
     - (2) from diverticula of the concave side of the bowel, thus reaching an intramesenteric position.
   - C. Cysts arising from urogenital organs, germinal epithelium, ovary, wolffian body of mullerian duct.
2. Pseudocysts
   - A. Infective origin
     - (1) Hydatid cysts.
     - (2) Degenerated tuberculous disease.
   - B. Cystic malignant disease.

Excellent bibliographies are furnished in articles by Hinkel, by Vaughn, Lees and Henry, and by Bristow and Brown.

SUMMARY

Two mesenteric cysts are reported having very thin walls and containing a watery fluid. They were at the same site between the peritoneal folds covering the colon close to the hepatic flexure. The diagnosis was made from the X-ray examinations and confirmed at operation.

RESUME

Il s'agit de deux kystes mésentériques à paroi mince contenant un liquide aqueux. Ils étaient situés tous les deux au même endroit entre les replis péritonéaux qui recouvrent le côlon de son angle hépatique.

Le diagnostic fait par les examens radiologiques fut confirmé par l'opération.

REFERENCES

1. Hinkel, C. L., Amer. Jour. Roent. & Rad. Ther., Vol. 48, 1942.

2. Vaughn, A. M., Lees, W. M. and Henry, J. W.; Surgery, Vol. 23, No. 2, 1948.

3. Beahrs, O. H. and Judd, Jr., E. S.; Proceedings of Mayo Clinic, Vol. 22, No. 15, 1947.

4. Bristow, R. J. and Brown, E. L.; Can. Med. Assn. Jour., Vol. 61, No. 5, 1949.

5. Peterson, E. W., Ann. Surg., Vol. 112, 1940.

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1951 MID-WINTER MEETING — NIAGARA FALLS, ONTARIO
January 3rd, 4th and 5th
at the
HOTEL GENERAL BROCK

		Place
January 3rd, 9:30 A.M.	Meeting of Executive	Hotel General Brock
3rd, 2:00 P.M.	Meeting of Council	" " "
3rd, 6:15 P.M.	Dinner, to be followed by Special General Meeting.	" " "
January 4th, 9.30 A.M.	Scientific Sessions	Hotel General Brock
4th, 2:00 P.M.	Scientific Sessions	" " "
4th,	Annual Dinner, Dr. G. H. Guest, National Research Council, as guest speaker.	" " "
January 5th:	Scientific Sessions	The Radiological Institute, Buffalo, New York.

IMPORTANT

Present developments indicate that there will be a good attendance at this mid-winter session, therefore if you have not made your reservation, please write directly to Hotel General Brock without delay.

In Memoriam

It is with deep regret that the Canadian Association of Radiologists records the deaths of six senior radiologists during the year 1950.

COGHLIN, William Alexander
April 12th, 1877, Listowel, Ontario
MD. — University of Manitoba 1907.

McINTOSH, Hamish Heney
October 12th, 1879, VanKleek Hill, Ontario
M.D. — McGill University 1903.

McMILLAN, James Currie
1883 — Manitoba
M.D. — University of Manitoba 1907.

RITCHIE, William Lloyd
January 13th, 1883, Beamsville, Ontario
M.D. — University of Toronto 1910.

THOMAS, Robert Arthur
November 21st, 1877, Toronto, Ontario
M.D. — Trinity University, England, 1902.

WHITELAW, W. A.
August 15th, 1884, Meaford, Ontario
M.D. — McGill University 1907.

1951 MID-WINTER MEETING — NIAGARA FALLS, ONTARIO

January 3rd, 4th and 5th

at the

HOTEL GENERAL BROCK

SCIENTIFIC PROGRAMME

OPENING SESSION

Chairman — Dr. A. E. Broome, Kitchener, Ont.

THURSDAY, JANUARY 4th — 8:30 A.M. Registration

9:00 A.M.	Words of Welcome — the Mayor of Niagara Falls. Greetings — the President of the Niagara Falls Medical Association.
9:30 A.M.	Dr. D. G. Wollin, Toronto, "Radiological Investigation of Eighth Nerve Tumours".
9:50 A.M.	Dr. C. B. Peirce, Montreal. "Some Considerations in the Diagnosis and Treatment of Early Carcinoma of the Cervix".
10:10 A.M.	Dr. A. Morrison, National Research Council, Ottawa. "Some Physical Problems in Radiology".
10:30 A.M.	Intermission for 10 minutes.

Chairman — Dr. R. W. Boyd, Vancouver

10:40 A.M.	Dr. Jean Bouchard, Montreal. "The Management of Metastases from Carcinoma of the Breast".
11:00 A.M.	Dr. Owen Millar, Toronto. "The Use of Hormones in Advanced Breast Cancer".
11:20 A.M.	Dr. George H. Ramsey, Rochester. "Cinefluorographic Studies of Congenital Hearts".

AFTERNOON SESSION

Chairman — Dr. A. C. Singleton, Toronto

2:00 P.M.	Dr. Strain, Rochester, N.Y. (By invitation.) "A New Dye for Gall Bladder Radiology".
2:20 P.M.	Dr. R. L. DuBerger, Sherbrooke. "Some Observations on Radiology of the Small Bowel".
2:40 P.M.	Dr. Norman Heilbrun, Consultant Radiologist, Veterans' Administration, Buffalo. (By invitation.) "Case Reports of Small Bowel Tumours".
3:30 P.M.	Dr. Charles Hyndman, Montreal. "Some Physiological Aspects of Intestinal Obstruction".
3:20 P.M.	Intermission for 10 minutes.

Chairman — Dr. Jules Gosselin, Quebec

3:30 P.M.	Dr. Gordon J. Culver and Dr. M.V. Caldwell, Buffalo General Hospital. (By invitation.) "Endometriosis Involving the Sigmoid Colon". (To be presented by Dr. Culver.
3:50 P.M.	Dr. George N. Scatchard, Children's Hospital, Buffalo. (By invitation.) "Gastrointestinal Anomalies in Infants".
4:10 P.M.	Dr. Albert Jutras, Montreal. "The Similarity of Sphincters in the Gastrointestinal Tract".
6:00 P.M.	Cocktail party. Guests of President and Mrs. E. A. Petrie.
7:00 P.M.	Annual dinner. Speaker — Dr. G. H. Guest, Senior Scientific Officer, Health Radiation Section, Department of National Health and Welfare, Ottawa. Subject — "Health, Radiation, and the Radiologist".

FRIDAY, JANUARY 5th

MORNING SESSION

Chairman — Dr. Digby Wheeler, Winnipeg

9:00 A.M.	Dr. J. E. Whiteleather, Baptist Memorial Hospital, Memphis. (By invitation.) "Disturbance in Fluid Balance Detected by the Chest Radiograph".
9:30 A.M.	Dr. J. G. Stapleton, Hamilton. "Alveolar Cell Carcinoma of the Lung".
9:50 A.M.	Dr. Francis W. O'Donnell, thoracic surgeon, the Millard-Filmore Hospital, Buffalo. (By invitation.) "Differential Diagnosis of Solitary Pulmonary Lesions".
10:10 A.M.	Dr. Brian Holmes, Toronto. "Cholesteatomas of the Mastoid Region".
10:30 A.M.	Intermission for 10 minutes.

Chairman — Dr. A. E. Walkey, Hamilton

10:40 A.M.	Dr. Norman A. McCormick, Windsor. "Some Further Observations on Cancer Mortality Trends".
11:00 A.M.	Dr. O. Dufresne and Dr. G. Gill, Montreal. "Roentgentherapy in Thyrotoxicosis".
11:20 A.M.	Dr. W. E. Crysler, Brantford. "Bronchopulmonary Segments". (Coloured motion picture.)
1:30 P.M.	LEAVE GENERAL BROCK HOTEL FOR BUFFALO, N.Y.

AFTERNOON SESSION

Roswell Park Memorial Institute, Buffalo

Chairman — Dr. C. B. Peirce, Montreal

3:00 P.M.	Dr. Walter T. Murphy, Buffalo. "Problems in Radiation Therapy". Dr. Louis C. Kress, Buffalo. "Bone Tumours". The presentation of these papers is to be followed by a tour of the Institute.
5:30 P.M.	Join ladies for cocktails at the Buffalo Athletic Club. Guests of Buffalo Radiological Society.
6:30 P.M.	Dinner at the Town Casino. (Floor show and dancing.)

1951 MID-WINTER MEETING — NIAGARA FALLS, ONTARIO

January 3rd, 4th and 5th

at the

HOTEL GENERAL BROCK

COMMITTEES

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Chairman — Dr. A. E. Broome

Dr. Margaret E. Bickle
Dr. Jean Bouchard
Dr. Karl Garten
Dr. Donald C. MacNeill
Dr. John G. Stapleton
Dr. Charles E. Vaughan

Scientific Committee

Dr. C. E. Vaughan
Dr. Lloyd S. Green
Dr. Karl Garten

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Greater Niagara General Hospital,
Niagara Falls, Ontario.

Publicity

Dr. John G. Stapleton,
McGregor Clinic,,
Hamilton, Ontario.

Entertainment Committee

Dr. Donald C. MacNeill,
General Hospital,
Welland, Ontario.

Ladies' Committee

Dr. M. E. Bickle
Mrs. Geo. N. Scatchard
Mrs. W. R. Scott

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Mid-Winter Meeting — Canadian Association of Radiolosists

January 3rd, 4th, 5th, 1951 — Niagara Falls, Ont.

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Time of Arrival ..... Departure date ..... Time of Departure .....

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